biometra
a part of Analytik Jena

Standard Power Pack P25T

Order-No. 040-850

Manual

May 2009

!!Attention!!
Please read this manual carefully
prior to operating the device

Biometra GmbH
Rudolf-Wissell-Straße 30, D-37079 Göttingen
P.O. Box 1544, D-37005 Göttingen
Phone: ++49 – (0)5 51 / 50 68 6-0
Fax: ++49 – (0)5 51 / 50 68 6-66
E-mail: Info@biometra.com
Internet: http://www.biometra.com

Service Division
Rudolf-Wissell-Straße 14-16, D-37079 Göttingen
Phone: ++49 – (0)5 51 / 50 68 6-10 or -12
Fax: ++49 – (0)5 51 / 50 68 6-11
E-mail: Service@biometra.com

1.0 Intended Uses and Specification

The Biometra **Power Pack P25 T** is suitable for PAGE, SDS-PAGE, agarose gel electrophoresis, blotting and electroelution of proteins and DNA/RNA from gels.

The Power Pack P25 T is intended for use with any electrophoresis applications designed to operate below 400 volts and 500 milliamps DC (electrophoresis) or 200 volts and 1000 milliamps DC (blotting). Four sets of outputs operate in parallel to provide 0 to 400 volts, up to 1000 milliamps, and up to 200 watts in constant voltage or constant current mode. Voltage and current setting is adjustable in steps of 1V and 1mA.

In addition, the Power Pack P25 T offers a timer function, which shuts down the output voltage after a defined time. The timer can be set between 1 minute and 1999 minutes.

A single LCD display provides output voltage or current readings.

2.0 Technical Data

Type Output:	Constant Voltage and Constant Current
Max. Voltage:	400 VDC
Max. Current:[1]	1000mA in the range 0-200VDC <1000mA in the range 200-400VDC
Max. Power:	200 W, continuous
Timer:	1 minute to max. 1999 minutes
Output Display:	LCD-display, 3.5 digits, selectable between display mA, V and min. Resolution 1 mA, 1 V, and 1 min., respectively
Accuracy:	+- 5% v.M. (for U, I >= 0,05 * Umax, Imax) +- 5% of 0,05 * Umax, Imax (for U,I < 0,05 * Umax, Imax) Arithmetic mean over 3 s, T_s = 0.4 s
Number of Output Terminals:	Four sets of 4 mm safety-sockets
Input Power:	100–240VAC/50-60Hz/max. 300W
Allowable deviation:	+6/-10%
Ambient Operating Temperature Range:	0 to 40°C
Humidity:	0 to 70%
Dimensions:	(W x L x H) 26.5 x 25.0 x 9.5 cm
Weight:	3 kg

The Power Pack P25 T is designed for use with AC net supply voltages between 100 Volt and 240 Volt, 50-60Hz. It is a switched mode power supply providing voltage and current controlled DC power, respectively. The DC output is free of ground and short-circuit proof.

[1] See also chapter 5.10

3.0 Safety Instructions

The Power Pack P25 T must only be used in accordance with its designation. The use of this device unconformably to the operating instructions will dissolve any responsibility and liability.

Observe the relevant rules for accident prevention as well as those of approved safety and occupational medicine!

Do not attempt any repair yourself. In need of repair, consult your local qualified service representative. Only qualified personnel may open the housing parts. The inner device may still contain dangerous voltage several minutes after disconnection from power supply.

Make sure the indicated voltage and frequency range of the device corresponds with the system voltage and that the power switch is on “0” before it is connected to the power supply.

Connect the device to a properly grounded outlet only!

Pull the power cord out of the outlet to safely disconnect from the power supply.

Use exclusively the provided power cord or one that meets the legal requirements.

Pay attention to the dimensioning of the fuses and replace them if required. The fuse holder is located in the lower part of the power connector on the back side of the Power Pack. The following fuses are required:

Micro-fuses, slow blow 2 x 5A; 250 V

"Caution: For continued protection against risk of fire, replace only with same type and rating of fuse".

"Caution: Double pole/neutral fusing, disconnect power before changing fuse"

In order to ensure the safe electrical disconnection the floating outputs must never be grounded.
Make sure that your test setup always complies to this condition.

Only safe electrical cords certified according to IEC / EN 61010-2-031 may be connected to the power outputs.

Make sure the Power Pack P25 T is located in a safe and dry place, in proximity to the electrophoresis devices powered. Keep away from liquids. Should a liquid penetrate the P25 T, disconnect the device immediately.

Do not operate in a damp or humid environment where condensing moisture may lead to creeping current. See chapter 2 (Technical Data) for ambient operating temperature range.

When moving from a cold to a warm room, allow 8 hours before reusing the device in order for it to reach the ambient temperature and for possible condensation to evaporate.

Use only mild, non-abrasive detergents. Carefully clean the device to avoid liquids penetrating the inner housing.

When positioning the P25 T, make sure the ventilation openings on the back side are not covered.

Should the Power Pack become extremely warm, smoke or display unusual information while in operation, discontinue use immediately and contact a qualified service representative.

4.0 Set Up

4.1 Content

- Power Pack P25 T
- Manual
- Power Cord

4.2 Unpack and Check

Your **Biometra Power Pack P25 T** has been carefully packed to ensure its safety. Please unpack it carefully, control the integrity of its content and inspect the device. Report any damage immediately to BIOMETRA!

Do not operate a device which is in no proper condition.

Should you have a complaint, return the complete system in its original packing by following the return instructions (see chapter 8.0).

!!Attention!!

Please send back the enclosed postcard along with the filled out Warranty Certificate to Biometra in order to claim the full warranty!

4.3 Power Supply

Before connecting, make sure the actual voltage complies with the voltage range indicated on the type label.

Caution:
The Power Pack P25 T must be grounded!

4.4 Location

The Power Pack P25 T must be located in a dry and safe place. Do not place an electrophoresis chamber on the power supply device. The ventilation openings on the back side must not be covered by other devices, furniture or fixtures. A sufficient air flow for convection cooling must be provided.

4.5 Electrophoresis Chamber Connection

The electrophoresis chamber is connected to the Power Pack P25 T by safety cords. Use exclusively electrophoresis devices with safety connectors.

Switch off the Power Pack P25 T while working on the test equipment setup.

5.0 Operation

5.1 Power On

Establish the connection to the electrophoresis chamber(s) before switching on the Power Pack P25 T. Then switch on the device using the power switch. A green light appears over the power switch when power is turned on.

⚠ **When power is turned on, the P25 T sets the output voltage or current to the latest value stored.**

Should you be unsure of the latest saved settings, detach all connections to the electrophoresis chamber and switch on the Power Pack P25 T in order to check the voltage or current settings (see chapter 5.4 Voltage Setting).

⚠ The device must always be turned off before the supply line to the electrophoresis chamber is to be connected or removed for any given reason (power switch on "0" and LED not illuminated).

5.2 Timer Mode On/Off

The "TIMER" button sets the Power Pack P25 T on timer or continuous mode. When the timer is activated (illuminated LED left of timer button) the output voltage will switch off by itself after the given time interval has elapsed (see chapter 5.3 and 5.6 to start the timer and set time intervals).

5.3 Voltage On/Off

To turn the output voltage on or off, press the “OPERATION” button. A timer will start counting when the timer function of the device is activated. The output voltage will switch off by itself after the given time interval has elapsed. A green LED (left of “OPERATION” button) shows when the output voltage is turned on.

Operating this button does not constitute a safe disconnection from the power source. The device must always be turned off before the supply line to the electrophoresis chamber is to be connected or removed for any given reason (power switch on “0” and LED not illuminated).

5.4 Voltage Setting

First turn off the output voltage by using the “OPERATION” button.

Then, by using the “SELECT” button, switch to “VOLT” on the display. Set the desired output voltage by turning the knob.

In normal mode, the display shows the output voltage (actual value). By turning the knob, the display changes from the actual value to the desired set value, recognizable by the flashing “VOLT” LED indicator. The desired value increases with every clockwise rotation and decreases with every counter clockwise rotation. Depending on speed and direction of the rotation, the value will augment or reduce in steps of 1V, 10V or 100V. A set value modified by the user will, 3 seconds after the last operation of the knob, precede all other values and will be set as the desired output voltage.

The voltage value (V) should be set without any device connected!

5.5 Current Setting

Turn off the output voltage by using the “OPERATION” button.

Then, by using the “SELECT” button, switch to “mA” on the display. Set the desired output current by turning the knob.

In normal mode, the display shows the current conduction (actual value). By turning the knob, the display changes from the actual value to the desired set value, recognizable by the blinking “mA” LED indicator. The desired value increases with every clockwise rotation and decreases with every counter clockwise rotation. Depending on speed and direction of the rotation, the value will augment or reduce in steps of 1mA, 10mA or 100mA. A set value modified by the user will, 3 seconds after the last operation of the knob, precede all other values and will be set as the desired output current.

⚠ **The electric current value (mA) should be set without any device connected!**

5.6 Time Interval Setting

By using the “SELECT” button, switch to “TIMER” on the display. Set the desired time interval value by turning the knob.

In timer mode, the display shows the remaining time period (actual value). If time is up or the device is set on continuous operation mode the value “----” will appear. By turning the knob, the display changes from the actual value to the desired set value, recognizable by the flashing “TIMER” LED indicator. The desired value increases with every clockwise rotation and decreases with every counter clockwise rotation. Depending on speed and direction of the rotation, the value will augment or reduce in steps of 1 minute, 10 minutes or 100 minutes. A default value modified by the user will, 3 seconds after the last operation of the knob, precede all other values.

5.7 Monitoring Voltage, Current and Timer

5.7.1 Monitoring Set Values

Choose the desired measurement category by using the “SELECT” button in order to monitor the default voltage and current values. Then turn the knob to the right or to the left by one detent and the LCD displays will show the desired set value of the corresponding measurement. The value appearing on the display will, 3 seconds after the last operation of the knob, precede all other values. The LCD display will then automatically be switched to the actual value.

5.7.2 Monitoring Actual Values

Choose the desired measurement category at any time by using the “SELECT” button in order to control the output voltage and current. In doing so, only the LCD display will be switched. The supplied current or applied voltage will not be affected by this operation.

5.8 Working with Constant Voltage

Adjust the voltage controller’s set value to the desired output voltage (see chapter 5.4 Voltage Setting) when working with constant voltage. Then select the maximum possible or allowable value for the current controller’s set value. The current controller’s set value will then be the maximum possible or allowable value chosen (see chapter 5.5 Current Setting).

The Power Pack P25 T supplies a constant output voltage until reaching the selected current limit (voltage control). The output current then varies according to the ohmic resistance of the electrophoresis chambers. The output of a constant voltage will be shown by the LED indicator “VOLTAGE” (see chapter 6.4 Operating Status Display).

Should the maximum allowable output current be exceeded, the Power Pack P25 T will limit the current and the output voltage will drop.

Application example:
An agarose gel electrophoresis should be conducted with a constant voltage of 150V. For safety reasons the output current should not exceed 300mA. The following set values will be applied:

Output voltage:	*150V*
Output current:	*300mA*

5.9 Working with Constant Current

Adjust the current controller's set value to the desired output current (see chapter 5.5 Current Setting) when working with constant current. The voltage controller's set value will then have been selected so high that the device will switch to current limit mode (see chapter 5.4 Voltage Setting).

When the current output has reached the desired set value, the Power Pack P25 T will limit the current. The voltage output will then adjust to the ohmic resistance of the electrophoresis chamber and the current output will remain constant.

The LED indicator "CURRENT" (see chapter 6.4 Operating Status Display) is illuminated throughout the current limitation mode.

Should the set value for the voltage controller be selected too low, the output voltage will therefore not suffice to reach the desired current.

The output power of the Power Pack P25 T is limited to 200W. The maximum allowable current output of the device is limited to 200V as shown in figure 1 of chapter 5.10.

Application example:
A semi-dry blot should be conducted with a constant current of 800 mA. For safety reasons the output voltage should not exceed 50V. The following set values will be applied:

Output voltage:	*50V*
Output current:	*800mA*

5.10 Power Limitation

The output power of the Power Pack P25 T is limited to 200W. Should the user's selected voltage and current defaults exceed the maximum allowable output power, the device will reduce the default set value of the output current as shown in figure 1.

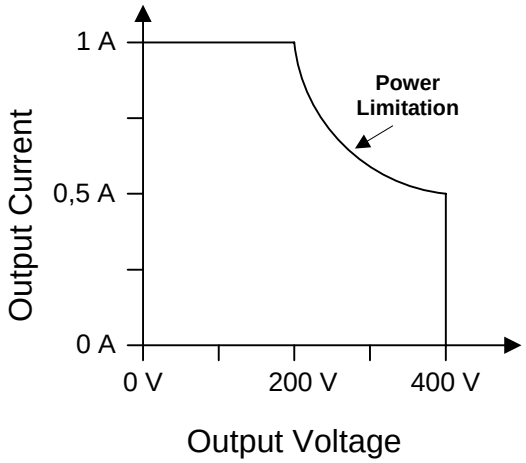

Figure 1: Automatic limitation of the output current at high output voltage values

The "CURRENT" and "VOLTAGE" LED indicators are both illuminated when the current limitation is accessed (see chapter 6.4 Operating Status Display) to give a signal that the output current, due to the **"power limitation"**, is lower than the value originally set by the user.

5.11 Switching Off

The Power Pack P25 T can be turned on or off by pressing the on/off switch.

The device must always be turned off before the supply line to the electrophoresis chamber is to be connected or removed for any given reason (power switch on “0” and LED above not illuminated).

6.0 Status Notification

6.1 Power ON LED

A green LED located above the on/off switch shows, along with the on/off switch position, if the Power Pack P25 T works properly.

on/off switch position	LED indication	Meaning
"O"	dark	No error: Power off
"I"	green	No error: Power on
"I"	dark	Error: • No connection to power • Faulty fuse • Device failure

The Power On LED remains dark although the device is switched on when there is an operation or hardware failure. In such case, please verify that

- the power outlet supplies electricity,
- the Power Pack P25 T is correctly connected to the power source,
- the fuses in the power inlet socket are not defective.

Caution: Disconnect the device from the power supply by unplugging the power cord before any fuse replacement!!!

6.2 Display Indication

The actual and set values for the voltage and current outputs will alternatively be shown on the LCD display (see chapter 5.7 Monitoring Voltage, Current and Timer). The three LEDs on the right side of the display indicate to which parameter the value shown on the display belongs. The following rules apply:

LED indication	Display indication
“mA” – LED illuminated	Output current in mA
“VOLT” – LED illuminated	Output voltage in volt
“TIMER” – LED illuminated	Remaining time in minutes
“mA” – LED flashes	Set value for the current control in mA
“VOLT” – LED flashes	Set value for the voltage control in volts
“TIMER” – LED flashes	Set value for the timer in minutes

6.3 TIMER and OPERATION display mode

Two LEDs next to the “OPERATION” and “TIMER” buttons indicate if the timer function is activated and if the output voltage is turned on or not. The following rules apply:

LED indication	Display indication
“TIMER” – LED on	Timer mode
“TIMER” – LED off	Duration mode
“OPERATION” – LED on	Output voltage activated
“OPERATION” – LED off	Output voltage deactivated

6.4 Operating Status Display

The Power Pack P25 T is in one of the following three operating modes “voltage limitation”, “current limitation” and “power limitation” depending on the selected voltage and current settings and the ohmic resistance of the electrophoresis chamber. The operating mode is indicated by the two LEDs located below the display. The following rules apply:

LED indication	Display indication
“CURRENT” – LED illuminated	Current limitation
“VOLTAGE” – LED illuminated	Voltage limitation
“CURRENT” – LED and “VOLTAGE” – LED illuminated	Power limitation

In the “voltage control” mode the output voltage will remain equal to the selected value (see also chapter 5.8 Working with Constant Voltage).

Should the output current exceed the selected default value, the **“current limitation”** function of the Power Pack P25 T is activated. The output voltage is now adjusted to the ohmic resistance of the electrophoresis chamber. The output current remains limited to the selected default value (see also chapter 5.9 Working with Constant Current).

Should the user’s selected voltage and current defaults exceed the maximum allowable output power of 200W, the device will reduce the maximum allowable output current according to figure 1 in chapter 5.10. Both LED indicators are illuminated when the current limitation is accessed to indicate that the output current, due to the “**power limitation**”, is lower than the value originally set by the user.

7.0 Cleaning

Disconnect the Power Pack. Use only mild, non-abrasive detergents and a slightly moistened soft cloth. Do not use solvents, soak while cleaning or immerse in water!

8.0 Service

Should you have any problem with the device, please contact our service division or your local Biometra dealer:

Biometra GmbH
Service Division
Rudolf-Wissell-Straße 14-16, D-37079 Göttingen
Phone: ++49 – (0)5 51 / 50 68 6-10 or -12
Fax: ++49 – (0)5 51 / 50 68 6-11
E-mail: Service@biometra.com

Please follow the return instructions when returning the device:

Return instructions

- Return only faulty devices. Please contact the technical support of **Biometra** (Phone: ++49 - (0)5 51/50 68 6 - 10 or - 12) to get an **RAN number.**
- Use the original packing or a similar robust packing when returning the material.
- Mark the outer packing with "CAUTION! SENSITIVE ELECTRONIC INSTRUMENT!" and the RAN number sticker. **Deliveries without RAN number can not be accepted!**
- Please include a **precise description of the problem** and preferably one that also points out by which procedure the failure occurs or where it originates.
- **Important:**

Clean every part of the device from residues such as chemical, radioactive and dangerous biological contamination. Please **confirm in writing (Equipment Decontamination Certificate)** before every return that the device is free of radioactive and

dangerous biological contamination. Contaminated devices sent to **Biometra** will be refused!

- The **sender will be liable** for the repair order in case of damage resulting from an inadequate decontamination of the device.
- Please include a note with the following information:
  a) Sender's name and address
  b) Contact person and phone number in case of inquiry.

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Equipment Decontamination Certificate

To enable us to comply with german law (i.e. §71 StrlSchV, §17 GefStoffV and §19 ChemG) and to avoid exposure to hazardous materials during handling or repair, will you please complete this form, prior to the equipment leaving your laboratory

COMPANY / INSTITUTE _____

ADDRESS _____

TEL NO _____

FAX NO _____

E-MAIL

_____

EQUIPMENT	**Model**	**Serial No**
	_____	_____
	_____	_____
	_____	_____
	_____	_____

If on loan / evaluation **Start Date:** _____ **Finish Date** _____

Hazardous materials used with this equipment

_____

_____

_____

Has the equipment been cleaned and decontaminated? YES / NO (delete)

Method of cleaning / decontamination

_____

_____

_____

NAME _____ **POSITION** _____

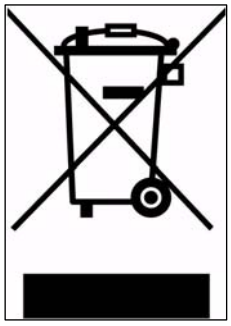
(HEAD OF DIV./ DEP./ INSTITUTE / COMPANY)

SIGNED _____ **DATE** _____

PLEASE RETURN THIS FORM TO BIOMETRA GMBH OR YOUR LOCAL BIOMETRA DISTRIBUTOR TOGETHER WITH THE EQUIPMENT.

PLEASE ATTACH THIS CERTIFICATE OUTSIDE THE PACKAGING. INSTRUMENTS WITHOUT THIS CERTIFICATE ATTACHED WILL BE RETURNED TO SENDER.

Note for Disposal of Electric/Electronic Waste



This symbol (the crossed-out wheelie bin) means, that this product should be brought to the return systems and/or separate systems available to end-users according to yours country regulations, when this product has reached the end of its lifetime!

For details, please contact your local distributor!

This symbol applies only to the countries within the EEA*.

*EEA = European Economics Area, comprising all EU-members plus Norway, Iceland and Liechtenstein.

9.0 Notes

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EU - Konformitätserklärung
EC - Declaration of Conformity

Göttingen, den 01. 10. 2004

im Sinne der EG-Richtlinie über elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen 73/23/EWG
following the EC directive about electrical equipment for use within certain limits of voltage 73/23/EEC

und / *and*

im Sinne der EG-Richtlinie für die elektromagnetische Verträglichkeit 89/336/EWG.
following the EC directive about the electromagnetic compatibility 89/336/EEC .

Hiermit erklären wir, daß das folgende **Power Pack** mit Timerfunktion,
*Herewith we declare that the following **Power** Pack with Timer,*

Typ / *type*:	**Standard Power Pack P25T** (Rev. b)
Best.-Nr. / *Order No.*	040-850

den grundlegenden Anforderungen der
corresponds to the basic requirements of

EG-Niederspannungsrichtlinie 73/23/EWG und der
EC low voltage directive 73/23/EEC and the

EG-Richtlinie über die elektromagnetische Verträglichkeit 89/336/EWG entsprechen.
EC directive about the electromagnetic compatibility 89/336/EEC .

Folgende harmonisierte Normen wurden angewandt:
The following harmonized standards have been used:

EN 60601-1-2:2001
EN 55011:1998 + A1:1999 + A2:2002
EN 61000-3-3:1995 + A1:2001
EN 61010-1:2001
EN 61000-3-2:2000
EN 61000-6-1:2001

Dr. Jürgen Otte
Quality Manager

Warranty

This Biometra device has been accurately produced and the quality thoroughly controlled before delivery and is therefore guaranteed to correspond to the product specifications in this manual. Biometra offers a **24-month** warranty on defective parts under the following conditions:

This warranty is valid for 24 months from date of shipment to the purchaser through Biometra or an authorized dealer and can not be assigned to a third party without Biometra's written agreement.

This warranty is limited to the product and, if applicable, to the standard original accessories. It is presumed that this device will exclusively be operated in accordance with Biometra's instructions.

Defective parts returned within the warranty period will be repaired or replaced without any charge by Biometra. This warranty does not cover damage caused by misuse, neglect or normal wear.

Biometra GmbH
Rudolf-Wissell-Straße 30, D-37079 Göttingen
P.O. Box 1544, D-37005 Göttingen
Phone: ++ 49 (0)5 51 / 50 68 6-0
Fax: ++ 49 (0)5 51 / 50 68 6-66
E-mail: Info@biometra.com
Internet: http://www.biometra.com